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INTERNATIONAL PRELIMINARY EXAMINATION REPORT
(PCT Article 36 and Rule 70)

Applicant's or agent's file reference G164.PC.225	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/IB 03/05790	International filing date (day/month/year) 05.12.2003	Priority date (day/month/year) 13.12.2002
International Patent Classification (IPC) or both national classification and IPC B65H7/06		
Applicant KBA-GIORI S.A. et al.		

<p>1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 5 sheets, including this cover sheet.</p> <p><input checked="" type="checkbox"/> This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).</p> <p>These annexes consist of a total of 5 sheets.</p>
<p>3. This report contains indications relating to the following items:</p> <ul style="list-style-type: none"> I <input checked="" type="checkbox"/> Basis of the opinion II <input type="checkbox"/> Priority III <input type="checkbox"/> Non-establishment of opinion with regard to novelty, inventive step and industrial applicability IV <input type="checkbox"/> Lack of unity of invention V <input checked="" type="checkbox"/> Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement VI <input type="checkbox"/> Certain documents cited VII <input type="checkbox"/> Certain defects in the international application VIII <input type="checkbox"/> Certain observations on the international application

Date of submission of the demand 12.07.2004	Date of completion of this report 06.12.2004
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized Officer Bonvin, C Telephone No. +49 89 2399-2056



**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/IB 03/05790

I. Basis of the report

1. With regard to the elements of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

Description, Pages

1-7, 9 as originally filed
8 filed with telefax on 12.07.2004

Claims, Numbers

1-11 \ received on 22.11.2004 with letter of 18.11.2004

Drawings, Sheets

1/4-3/4 as originally filed
4/4 filed with telefax on 12.07.2004

2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
 - the language of publication of the international application (under Rule 48.3(b)).
 - the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- contained in the international application in written form.
 - filed together with the international application in computer readable form.
 - furnished subsequently to this Authority in written form.
 - furnished subsequently to this Authority in computer readable form.
 - The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
 - The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

- 4. The amendments have resulted in the cancellation of:**

- the description, pages:
 - the claims, Nos.:
 - the drawings, sheets:

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5. This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	1-11
	No: Claims	
Inventive step (IS)	Yes: Claims	1-11
	No: Claims	
Industrial applicability (IA)	Yes: Claims	1-11
	No: Claims	

2. Citations and explanations

see separate sheet

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

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Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. The document US-A-5 443 257 (D1) is regarded as being the closest prior art to the subject-matter of claim 1.

D1 discloses a process for controlling the integrity of a paper sheet S, such a bake note, and comprising a (first) trigger or sensor 60A, 60B or 60C at a selected (first) location along the direction of displacement of the paper sheet for detecting the passage of an edge of the paper sheet at said (first) location.

Starting from the controlling process disclosed in D1 an essential purpose of the present invention is to improve the control of the integrity of the paper sheet.

This purpose is achieved by means of a first trigger 2, a second trigger 5 and a first checkpoint detector 3, all these elements being arranged and functioning stated in claim 1.

The claimed solution is neither disclosed nor suggested by the cited documents. Indeed, in D1, for example, the sensors or triggers 60A-60B are aligned in a row in a direction perpendicular to the direction of displacement of the paper sheet, an not in a spaced relationship in said displacement direction. In US-A-4 623 975 (D2) there is only the teaching of a single trigger 31, 35 located upstream of a further detector 39 along the direction of displacement of the paper sheet P.

Therefore, the subject-matter of claim 1 is new and involves an inventive step.

2. The conclusion of the above point 1 is also valid for the corresponding control device for controlling the integrity of a paper sheet according to the independent claim 7, and for the machine according to the independent claim 11 comprising a control device according to claim 7.
3. Claims 2-6 and 8-10 are dependent on claim 1, resp. 7, and as such also meet the requirements of the PCT with respect to novelty and inventive step.

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reference to the process of the invention. For example, a detector is used as the first trigger 2, a detector as first checkpoint 3 detector, a detector as second checkpoint 4 detector and a detector as second trigger 5.

All detectors are placed at appropriate distances between them, the sum of the relative distance being sufficient to properly carry out the process. The distances may be adjusted depending on the size of the substrate being controlled. All detectors are connected to a circuit 14 which is able and programmed to collect the information about the respective detection made by the detectors , use this information to decide whether or not the control of a given substrate has given the proper sequence of detection, and generate an error message of necessary.

The detectors are preferably optical detectors made of LED or other equivalent light emitters, which are known in the art. They each further comprise a detecting element which is able to detect a change in the reflection of the light emitted by the diodes, due to a modification of the background, for example when the background changes from a dark background to a clear background (detection of the leading edge of a substrate) or from a clear background to a dark background (detection of the trailing edge of a substrate), that is absence of substrate such a paper and presence of substrate.

A circuit which can be used in the method according to the invention is represented in figure 5 of the application. Derived from the above-mentioned boolean operations, the circuit given as a logic circuit fulfils the needed function. Since the detection of a leading edge is the Boolean negation of the trailing edge the output of the RS-flip-flop Q_1, Q_2 will give the result for the integrity of the trailing edge whereas $\overline{Q_1}, \overline{Q_2}$ will give the result for the leading edge.

A simple trigger T can be used to reset the device when necessary.

A machine, for example a printing machine in the field of securities, may comprise at least one control device according the invention. Such a control device may also be

Claims

1. Process for controlling the integrity of planar substrate, such as sheets of paper, characterised by the following steps:
 -) detection of the passage of an edge of the substrate by a first trigger,
 -) detection of the passage of said edge of the substrate at least at a first selected checkpoint on the substrate,
 -) control of the presence of the detection of the edge of the substrate at said at least first checkpoint between said detection by said triggers and
 -) generation of an integrity check failed message in the absence of the detection of the edge of the substrate at said checkpoint.
2. A process as claimed in claim 1, wherein it comprises two or more selected checkpoints.
3. A process as claimed in claim 2, wherein the integrity check failed message is generated in the absence of the detection of the edge of the substrate at said checkpoints between the detection by said two triggers.
4. A process as claimed in claims 1 to 3, wherein said checkpoints are close to the corners of said substrate.
5. A process as claimed in one of the preceding claims, wherein said edge is the leading edge and/or the trailing edge of the substrate.
6. A process as claimed in one of the preceding claims, wherein said detection is made by optical means.
7. A control device for carrying out the process of one of the preceding claims, said device being characterised by at least three detectors (10,11,12,13) and a computer element (14), said detectors being arranged to detect the passage of an edge (6,7) of a substrate (1) at least at three different moments and at least at three different places

along said edge in order for the computer element (14) to control the integrity of the substrate (1).

8. A control device as claimed in claim 7, characterised in that it comprises four detectors (10,11,12,13) arranged to detect four different places along an edge (6,7) of the substrate (1).

9. A control device as claimed in claims 7 or 8, characterised in that said detectors (10,11,12,13) are optical detectors.

10. A control device as claimed in one of claims 7 to 9, characterised in that said detectors (10,11,12,13) comprise light emitting diodes.

11. A machine characterised by at least one control device according to one of claims 7 to 10.

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Fig.5

